

REMARKS

Claims 1-63 are currently pending in the application. Claim 39 has been amended herein. No claims have been added or cancelled herein. Therefore, following the entry of this paper, claims 1-63 will be pending in the present application. Reconsideration of the present application is respectfully requested.

Claims 1-63 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 7,085,788 B2 (hereinafter referred to as “the ‘788 patent”) to Arakawa et al. The rejection is respectfully traversed.

Claims 1-38

With respect to independent claim 1, this claim is directed to a system for use in providing data storage and data copies over a computer network, comprising a storage server system and a data management system. The storage server system, as claimed, comprises “one or more data storage servers that each comprise a data storage device and a network interface, each of said data storage servers operable to communicate over said network interface with at least one application client that will require data storage and at least one other data storage server” The data management system, as claimed, comprises “at least one data management server operable to (a) define at least a first and a second cluster each comprising one or more data storage servers, (b) define at least one primary volume of data storage distributed over at least two of said storage servers within one of said clusters, said primary volume storing data from the application client, (c) define at least one remote volume of data storage distributed over one or more of said storage servers within one of said clusters; (d) create snapshots of said primary volume; and (e) copy data from said snapshots over the computer network to said remote volume.” The Examiner asserts that the ‘788 patent discloses the system as claimed in claim 1. However, upon a careful review of the ‘788 patent, it is seen that this reference does not disclose every element of claim 1. Thus, it is submitted that the ‘788 patent does not anticipate claim 1.

The ‘788 patent is directed to maintaining consistency in the sequence of write data between two storage devices (references 100, 190 of Fig. 1) when data is written to a first storage

device (storage device A 100) by a host computer (host A 700) that does not apply a write time to the write data (740). As noted at col. 2, lines 47-52, the '788 patent discloses that data is stored at a first logical volume (500) on storage device A (100), and the data is copied to a second logical volume (500) on storage device B (190). The '788 patent goes on at col. 2, lines 53-59 to describe that storage device A applies time information to write data when the write data does not include such information, and sends the write data and time information to storage device B. The received write data is then stored at storage device B in logical volume (500) in accordance with the time information applied by storage device A. This is supported by, for example, Fig. 3 (step 1001), and the associated description at col. 5, line 65 through col. 6, line 5, and col. 6, line 62, through col. 7, line 8. In this manner, the '788 patent ensures that the proper sequence of write data is stored at each storage device.

With respect to the storage devices (100, 190) themselves, and the logical volumes (500) of data that are stored at the storage devices, the '788 patent describes at col. 4, lines 43-50, that the storage device may include a number of physical storage devices, such as a number of disk drives, and may include mirrored devices or RAID type storage devices. The '788 patent does not provide significant details of data storage on the physical devices, as this reference is directed to maintaining data time consistency between copies rather than data storage at any particular storage device. The '788 patent describes at Fig. 2, and the associated discussion at col. 5, lines 17-46, that logical volumes may be grouped at a particular storage device (100 or 190), with different groups of logical volumes having different copy processing management. In any event, as illustrated in Fig. 2, multiple logical volumes are grouped at one storage device (100 or 190), and the volumes are copied to the other storage device (100 or 190).

Importantly, the '788 patent contains no disclosure of a storage server system and a data management system as claimed in claim 1. As recited by claim 1, the storage server system comprises "one or more data storage servers that each comprise a data storage device and a network interface, each of said data storage servers operable to communicate over said network interface with at least one application client that will require data storage and at least one other data storage server." The Examiner asserts that the storage devices (100, 190) described in the '788 patent disclose data storage servers as claimed. It is submitted that the storage devices described in the '788 patent do not disclose data storage servers as claimed. However, even

assuming, *arguendo*, that the '788 patent discloses such data storage servers, claim 1 goes on to recite a data management system comprising "at least one data management server operable to (a) define at least a first and a second cluster each comprising one or more data storage servers, (b) define at least one primary volume of data storage distributed over at least two of said storage servers within one of said clusters...." Even if the '788 patent discloses the claimed data storage servers, the reference is devoid of any teaching of a data management system as claimed. The Examiner asserts that the '788 patent, at col. 4, lines 43-46, discloses a data management system that is operable to define at least a first and a second cluster. However, this portion of the '788 patent merely describes that a particular storage device may include more than one physical device (e.g. multiple disk drives, RAID array, etc.). Thus, according to the Examiner's assertion, the '788 patent storage devices (100, 190) include clusters that have multiple physical storage devices. If this is the case, then each of the storage devices (100, 190) comprises one or more clusters, which is contrary to the claimed "primary volume of data storage distributed over at least two of said storage servers within one of said clusters." As discussed above, the Examiner asserts that the storage devices (100, 190) correspond to the claimed storage servers, and thus any clusters would then be included within a storage device, rather than storage devices within clusters as claimed.

Therefore, the '788 patent does not disclose the system of claim 1, and claim 1 is not anticipated by the '788 patent for at least this reason. As independent claim 1 is not anticipated by the '788 patent, it is submitted that claims 2-38, which depend (directly or indirectly) from claim 1, are also not anticipated by the '788 patent for at least the same reasons as claim 1. It is therefore respectfully requested that the rejection of claim 1-38 be reconsidered and withdrawn.

Claims 39-63

With respect to independent claim 39, this claim has been amended to more clearly point out the claimed invention, and is directed to a method for copying data from a primary data storage volume to a remote data storage volume in a distributed data storage system. The method comprises: (a) defining a first primary volume of data storage distributed over at least two data storage servers within a first cluster of data storage servers, each of said data storage servers comprising a data storage device and a network interface; (b) generating a first primary

snapshot of said first primary volume, said first primary snapshot providing a view of data stored at said first primary volume at the time said first primary snapshot is generated; (c) creating a first remote volume distributed over one or more data storage servers within a cluster of data storage servers; (d) linking said first remote volume to said first primary volume; and (e) copying data from said first primary snapshot to a first remote snapshot associated with said first remote volume. The Examiner asserts that the '788 patent discloses the method as claimed in claim 39. However, upon a careful review of the '788 patent, it is seen that this reference does not disclose every element of claim 39. Thus, it is submitted that the '788 patent does not anticipate claim 39.

As described above, the '788 patent is directed to maintaining consistency in the sequence of write data between two storage systems. The '788 patent discloses that data is stored at a first logical volume on a first storage device system, and that data is copied to a second logical volume on a second storage device system. The '788 patent describes at col. 4, lines 46-53, that the storage device may include a number of physical storage devices, such as a number of disk drives, and may include mirrored devices or RAID type storage devices. The '788 patent does not provide significant details of data storage on the physical devices, as this reference is directed to maintaining data consistency between copies rather than data storage at any particular storage device. The '788 patent describes, at Fig. 2, and the associated discussion at col. 5, lines 17-46, that logical volumes may be grouped at a particular storage device, with different groups of logical volumes having different copy processing management. In any event, as illustrated in Fig. 2, multiple logical volumes are grouped at one storage device (100, 190 in Fig. 1), and the volumes are copied to another storage device (100, 190).

Importantly, the '788 patent contains no disclosure of a method for copying data as claimed in claim 39. As recited by claim 39, one step in the claimed method is "defining a first primary volume of data storage distributed over at least two data storage servers within a first cluster of data storage servers, each of said data storage servers comprising a data storage device and a network interface." The Examiner asserts that the '788 patent teaches such a step at col. 4, lines 43-49. The cited portion of the '788 patent discloses that the storage devices (100, 190) provide logical volumes (500) of data storage, and also that "[i]t is not necessary that a single logical volume 500 should constitute the single physical device; for example it could be

constituted by a set of storage regions dispersed on a plurality of magnetic disc devices.” However, it is submitted that the storage devices (100, 190) described in the ‘788 patent, at most, simply describe single data storage servers that may each contain logical volumes of data stored on one or more physical devices. Thus, the cited portion of the ‘788 patent does not disclose data storage servers as claimed. It appears that the Examiner is interpreting the physical devices described in the ‘788 patent as each being a data storage server, with the logical volumes of the ‘788 patent distributed over two or more of the physical devices. However, even assuming, *arguendo*, that such an interpretation is accurate, the ‘788 patent still contains no disclosure of a primary volume distributed over at least two data storage servers within a first cluster of data storage servers, nor does the ‘788 patent disclose that each data storage server comprises a data storage device and an network interface.

Furthermore, claim 39 goes on to recite a combination of additional steps including (b) generating a first primary snapshot of said first primary volume, said first primary snapshot providing a view of data stored at said first primary volume at the time said first primary snapshot is generated; (c) creating a first remote volume distributed over one or more data storage servers within a cluster of data storage servers; (d) linking said first remote volume to said first primary volume; and (e) copying data from said first primary snapshot to a first remote snapshot associated with said first remote volume. The ‘788 patent is devoid of any teaching of a combination of steps as claimed. Thus, claim 39 recites a method that is not taught by the ‘788 patent.

Therefore, the ‘788 patent does not disclose the method of claim 39, and claim 39 is not anticipated by the ‘788 patent for at least this reason. As independent claim 39 is not anticipated by the ‘788 patent, it is submitted that claims 40-63, which depend (directly or indirectly) from claim 39, are also not anticipated by the ‘788 patent for at least the same reasons as claim 39. It is therefore respectfully requested that the rejection of claim 39-63 be reconsidered and withdrawn.

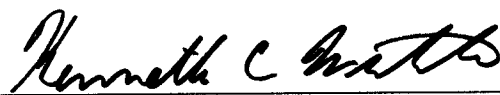
No claim related fees are believed to be due with this response. In the event any such fees are due, please debit Deposit Account 08-2623.

In the event that a petition for extension of time under 37 CFR §1.136(a) is required to have this reply considered and such a petition does not accompany this reply, please consider this a petition for an extension of time for the required number of months and authorization to debit Deposit Account 08-2623 for the required fee.

The application now appearing to be in form for allowance, reconsideration and allowance thereof is respectfully requested.

Respectfully submitted,

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